University of Technology Sydney
Faculty of Science

A Systematic Approach to Designing, Implementing and Evaluating Learner-Generated Digital Media Assignments (LGDM) in Undergraduate Science Students and its Effect on Self-Regulation.

A dissertation submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy (Science Education)

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CERTIFICATE OF ORIGINAL AUTHORSHIP

I, ***Jorge Reyna*** declare that this thesis is submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the Faculty of Science at the University of Technology Sydney. This thesis is wholly my own work unless otherwise reference or acknowledged. Also, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

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Other publications not included in this thesis

Peer-reviewed industry magazine

Reyna, J (2018). Learners as Co-Creators of Knowledge Using Digital Media. In: Curation vs Creation. *Training & Development* magazine, March 2018 Vol 45 No 1, published by the Australian Institute of Training and Development.

Peer-reviewed conference papers

Reyna, J (2019). A Model to Explore Learning Processes in Learner-Generated Digital Media (LGDM) Assignments. *Exploring New Frontiers in Education.* The 13th annual International Technology, Education and Development Conference, INTED2019, Valencia (Spain), March 11th-13th.

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Abstracts

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Reyna, J., Hanham, J., Meier, P (2017). Learning workflow using learner-generated digital media (LGDM) assignments. In H. Partridge, K. Davis, & J. Thomas. (Eds.), Me, Us, IT! Proceedings ASCILITE2017: 34th International Conference on Innovation, Practice and Research in the Use of Educational Technologies in Tertiary Education (pp. 57-62).

Reyna, J., Meier, P., Hanham, J., Vachopoulos, P & Rodgers, K (2017). Learner-Generated Digital Media (LGDM) Framework. Poster presented at the 11th annual International Technology, Education and Development Conference, INTED2017**,** Valencia (Spain), March 6th-8th.

Abstract

This study aimed to address the need for a systematic approach to LGDM assignments identified in the literature. The author proposed a set of four theoretical frameworks to design, implement, and evaluate LGDM tasks in science education. The Digital Media Literacies framework informed the development of training materials and marking rubrics. The Taxonomy of Digital Media Types guided the assessment weight and communicated to students and academics of the different media types available according to skills required for their production. The Digital Media Principles framework identified the standards the students and educators need to achieve to communicate effectively in the digital space. The LGDM Implementation framework guided the design, development, implementation and evaluation of digital media assignments in the classroom. A pilot study trialled these frameworks and validated an evaluation survey for LGDM assignments (Spring 2016). The students reported a positive attitude toward digital media for learning, highlighted creativity, teamwork, digital media support, and learning of subject content as the main features of the intervention.

The second part of the dissertation focused on the development of an additional framework to research student learning experience with LGDM assignments. It followed a mixed-methods approach, and the quantitative data section validated a self-regulation questionnaire, suggested to capture LMS logs, marks, and group contribution data. The qualitative part included open-ended questions and student interviews.

The last part of the dissertation included a large trial (n=1,687) across seven science subjects (Autumn, 2017). The aim was to gauge the utility of the theoretical frameworks proposed by answering research questions such as: *are the students self-regulating their learning when LGDM assignment design follows a systematic approach?* and; *how does a systematic approach guided by theoretical frameworks impact the overall student learning experience with LGDM assignments?* The students received LGDM training online and in a blended mode, and both groups showed a high score of self-regulation beliefs, being higher for online learners and female participants. Triangulating

the rest of the data sets found that students had a positive learning experience and answered the research questions proposed.

The contribution of this research has many implications. For practitioners, it offers a set of practical frameworks to guide the design, development and implementation of LGDM assignments. For researchers, the development of the theoretical framework to research the learning experience with LGDM assignments is the starting point to understand further a field considered under-theorised, under-researched and in early stages.